

WHAT IS CLAIMED IS:

1. A substrate treatment method comprising a wet ozone-containing gas treatment process for treating a work object on a surface of a substrate by supplying to said work object a wet ozone-containing gas wetted with a treatment solution,
said wet ozone-containing gas contains more vapor of said treatment solution than a saturation vapor level occurring at a given temperature of said substrate.
2. A substrate treatment method according to Claim 1 wherein said wet ozone-containing gas treatment process comprises:
maintaining said substrate at a temperature higher than room temperature; and
controlling said wet ozone-containing gas so as to be at a temperature approximately equal to or greater than the temperature of said substrate.
3. The substrate treatment method according to Claim 2 wherein the temperature of said wet ozone-containing gas is controlled so as to be between 5°C and 15°C higher than the temperature of said substrate.
4. The substrate treatment method according to Claim 1 further comprising a cleaning process after said wet ozone-containing gas treatment process, said cleaning process comprising cleaning said substrate with a cleaning solution containing at least one organic solvent chosen from a group comprising pure water, acidic aqueous solutions, alkaline aqueous solutions, ketones, and alcohols.
5. The substrate treatment method according to Claim 4 wherein said cleaning solution is at a temperature higher than room temperature.
6. The substrate treatment method according to Claim 4 wherein said wet ozone-containing gas treatment process and said cleaning process are repeated a number of times.
7. The substrate treatment method according to Claim 1 further comprising a pretreatment process before said wet ozone-containing gas treatment process, said pretreatment process comprising irradiating said work object on the surface of said substrate with ultraviolet light having a wavelength of 300 nm or more.
8. The substrate treatment method according to Claim 1 wherein said wet ozone-

containing gas is irradiated with ultraviolet light having a wavelength in a vicinity of 250 nm during said wet ozone-containing gas treatment process.

9. The substrate treatment method according to Claim 1 wherein said wet ozone-containing gas treatment process comprises reducing the amount of vapor supplied to said work object on the surface of said substrate by said wet ozone-containing gas as treatment time elapses.

10. The substrate treatment method according to Claim 1 wherein said wet ozone-containing gas treatment process comprises reducing the amount of vapor supplied to said work object on the surface of said substrate by said wet ozone-containing gas by raising the temperature of said substrate as treatment time elapses.

11. The substrate treatment method according to Claim 10 wherein said wet ozone-containing gas treatment process is performed in a number of treatment tanks and comprises setting the temperature of said substrate so as to be progressively higher in each successive treatment tank.

12. The substrate treatment method according to Claim 1 wherein said wet ozone-containing gas treatment process comprises reducing the amount of vapor supplied to said work object on the surface of said substrate by the wet ozone-containing gas by lowering the temperature of the wet ozone-containing gas as treatment time elapses.

13. The substrate treatment method according to Claim 12 wherein said wet ozone-containing gas treatment process is performed in a number of treatment tanks and comprises setting the temperature of said wet ozone-containing gas so as to be progressively lower in each successive treatment tank.

14. A substrate treatment assembly comprising:

- a substrate heating device for maintaining a substrate at a temperature higher than room temperature;

- a wetting device for obtaining a wet ozone-containing gas by wetting an ozone-containing gas with a treatment solution;

- a supply device for supplying said wet ozone-containing gas to a work object on a surface of said substrate;

- a gas conduit connecting said wetting device to said supply device; and

a wet ozone-containing gas heating device for heating said wet ozone-containing gas so as to be at a temperature approximately equal to or greater than the temperature of said substrate.

15. The substrate treatment assembly according to Claim 14 wherein said supply device comprises a gas disperser comprising a number of apertures aligned in a number of rows in a width direction of said work object, said disperser being constructed such that apertures in adjacent rows do not align with each other in a direction perpendicular to said rows, said supply device being constructed such that at least said gas disperser or said substrate is movable in a direction perpendicular to said rows.

16. The substrate treatment assembly according to Claim 15 wherein spacing between adjacent rows of aperture in said gas disperser is 5 mm or more.

17. A substrate treatment assembly for supplying an ozone-containing gas and a treatment solution to a work object on a surface of a substrate through a treatment agent supply plate disposed facing said work object, in which spacing between a surface of said work object and said treatment agent supply plate is between 0.1 mm and 1.0 mm.